IN THE CLAIMS

Please amend the claims as indicated below by the markings. Cancel Claims 9 and 10 without prejudice.

1. (Currently Amended) A motion sensor, comprising

a chamber capable of holding a medium wherein the medium includes a motile sample;

at least one force transducing sensor positioned to interact dynamically with said motile sample;

and means for detecting the motion of said motile sample through dynamic interaction of the force transducing sensor with ~~the motion of a~~ said motile sample whereby a characteristic of ~~the~~ said motile sample can be deduced.

2. (Currently Amended) The motion sensor of claim 1 wherein the motile sample includes at least one biological specimen.

3. (Previously Presented) The sensor of claim 1 wherein the force transducing sensor is a MEMS device.

4. (Previously Presented) The sensor of claim 3 where the MEMS device is a cantilever.

5. (Currently Amended) The sensor of claim 1 wherein the motile samples include biological specimens.

6. (Previously Presented) The sensor of claim 5 where the biological specimens are cells.

7. (Previously Presented) The sensor of claim 1 wherein the means for detecting uses optics.

8. (Currently Amended) The sensor of claim 1 wherein the medium is appropriate for biological ~~samples~~ specimens.

9. (Cancelled) ~~The sensor of claim 1 wherein the medium is pumped at a constant rate.~~

10. (Cancelled) ~~The sensor of claim 1 wherein the medium is pumped with repetitive pulses.~~

11. (Previously Presented) The sensor of claim 1 wherein the force transducing sensor includes a ribbon.

12. (Previously Presented) The sensor of claim 4 wherein the cantilever has a width that increases with distance measured from the cantilever support.

13. (Currently Amended) A motion sensing system comprising

a chamber adapted to receive a having therein a multiplicity of motile specimens;

at least one force transducing sensor positioned within the chamber so as to be immersed in the medium during operation;

force transducing sensor surface coatings having characteristics ~~times~~ appropriate for the motile specimens; and

a motion detector for detecting motion of the force transducing sensor caused by the motion of the motile specimens whereby the residence times of the motile specimens on the force transducing sensor surface coatings can be determined.

14. (Currently Amended) The motion sensing system of claim 13 wherein the motile specimens are part of a biological sample.

15. (Currently Amended) The motion sensing system of claim 13 wherein the force transducing sensor surface coatings are biologically active surface coatings.

16. (Previously Presented) The motion sensing system of claim 13 wherein the force transducing sensor is a MEMS device.

17. (Previously Presented) The motion sensing system of claim 16 wherein the MEMS device is a cantilever.

18. (Previously Presented) The motion sensing system of claim 17 wherein the MEMS device includes at least two cantilevers.

19. (Previously Presented) The motion sensing system of claim 18 wherein one cantilever is a reference cantilever with a biologically inactive surface coating.

20. (Previously Presented) The sensor of claim 5 wherein the biological samples as sperm.

21. (Previously Presented) A motion sensor comprising

a chamber adapted to receive for analysis a medium having therein a multiplicity of motile specimens moving within the medium with a motile frequency;

at least one force transducing sensor positioned within the chamber so as to be immersed in the medium during analysis and to interact dynamically with the motile specimens;

and a motion detector for determining the characteristic motile frequency of the specimens by detecting the dynamic interaction of the force transducing sensor.

22. (Previously Presented) The motion sensor of claim 21 wherein the motile specimens are biologically motile.

23. (Previously Presented) The motion sensor of claim 22 wherein the motile specimens are sperm.

24. (Previously Presented) The motion sensor of claim 21 wherein the force transducing sensor is a MEMS device.

25. (Previously Presented) The motion sensor of claim 24 wherein the MEMS device is a cantilever.

26. (Currently Amended) A method for determining characteristics of a <u>motile</u> sample under analysis comprising the steps of

providing at least one force transducing sensor having a surface;

<u>providing motile specimens in a fluid;</u>

the surface having a coating thereon capable of interacting with the motile specimens;
~~providing specimens in a fluid,~~
directing the motile specimens toward the surface at an angle substantially orthogonal to the surface, ~~and~~ causing an interaction between the motile specimens and the surface allowing said motile specimens ~~samples~~ to interact with the force transducing sensor; and
detecting a characteristic of the motile specimen in accordance with its interaction with the force transducing sensor.

27. (Currently Amended) A nanomotion sensing system comprising

at least one transparent substrate;

the substrate including at least one lens and having first and second a light source and a photodetector affixed to a first surface of the substrate;

a force transducing sensor having a cantilever affixed to the second surface of the assembly substrate in optical alignment with the light source and photodetector; whereby motion of said cantilever can be detected by the photodetector;

a chamber capable of holding a medium wherein the medium includes a motile biological sample; and

the force transducing sensor positioned to interact dynamically with said motile sample biological sample.

28. (Previously Presented) The nanomotion sensing system of claim 27 wherein the substrate, light source, photodetector and sensor are integrated into a single optical assembly.

29. (Previously Presented) The sensing system of claim 27 wherein the Light source is a laser.

30. (Previously Presented) The nanomotion sensing system of claim 27 wherein the force transducing sensor is affixed to the substrate at a predetermined angle.

31. (Previously Presented) The nanomotion sensing system of claim 27 wherein the force sensor is a MEMS device.

32. (Previously Presented) The nanomotion sensing system of claim 31 wherein the MEMS device is a cantilever.